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The Florida Buggist

Official Organ of the Florida Entomological Society.

VOL. I | WINTER NUMBER | NO. 3

December 21, 1917

Lowest Temperatures During the Cold Wave. Isotherms Drawn for Every Five Degrees.

*From U. S. Weather Bureau, Jacksonville, Fla., Feb., 1917.

THE EFFECTS OF THE FREEZE OF FEBRUARY 2-4, 1917 ON THE INSECT PESTS AND MITES ON CITRUS.*

By W. W. YOTHERS, Bureau of Entomology,
Orlando, Florida

WEATHER CONDITIONS AND TEMPERATURES

For more than five weeks prior to February 1st, the weather had been very warm. Many days the temperature reached 85° F., at Orlando, Florida, and on February 1st it reached 86° F., and it was a very sultry, calm day. Between 6 and 8 o'clock p. m., about half an inch of rain fell and there was more or less rain the entire night. The rain was followed immediately by a heavy wind from the northwest, which continued until late Saturday afternoon. It was quite calm, however, Saturday night.

The following minimum temperatures of localities, where examinations were made to determine the conditions of pests, were taken from the U. S. Weather Bureau:

Putnam County, Crescent City	19°F.
Volusia County, DeLand	15°F.
Marion County, Ocala	18°F.
Lake County, Eustis	20°F.
Orange County, Orlando	22°F.
Polk County, Winter Haven	25°F.
Polk County, Frostproof	27°F.
Pinellas County, Pinellas Park	27°F.

The zone of the lowest temperatures, from 15° to 20° F., comprise the citrus producing counties of Putnam, Volusia and Marion, with parts of Lake and Orange. In this zone there was practically complete defoliation of all citrus trees. Many grapefruit trees were killed to the ground and the oranges were killed back to within, from 4 to 8 feet of the ground. Hare in his report on the effects of the freeze† gives the following estimates of the percentage of the bearing wood that had been killed:

	Oranges	Grapefruit
Putnam County	80%	90%
Volusia County	90%	95%
Marion County	75%	85%
Part of Lake County	30%	40%
Part of Orange County	40%	50%

*Published by permission of the Chief of the Bureau. Read before the Florida Entomological Society October 10, 1917.

†Hare, C. C., "Report on Effects of the Freeze." U. S. Bureau of Crop Estimates.

The counties comprising the next warmest zone—temperatures between 20° and 25°F.—with the percentage of bearing wood killed as follows:

	Oranges	Grapefruit
Lake County	30%	40%
Orange County	40%	50%
Osceola County	20%	25%
Polk County	20%	30%
DeSoto County	25%	35%
Manatee County	20%	25%
Lee County	25%	35%

In this group there was about 90 to 95% defoliation of orange trees except in a few protected places. The grapefruit trees were completely defoliated.

The warmest of the three zones—temperatures between 25° and 30°F.—comprises the following counties with the percentage of bearing wood killed:

	Oranges	Grapefruit
Pinellas County	10%	15%
Dade County	5%	10%
Palm Beach County	0%	0%
St. Lucie County	0%	0%
Part Brevard County	15%	20%

The defoliation in this group was not sufficient to influence the number of white flies or other pests to a degree to be of economic importance.

CONDITION OF THE CITRUS TREES AT THE TIME OF THE FREEZE

Owing to the prolonged period of warm weather, citrus trees were in a growing condition. So far as can be determined, the condition of growth was in the same state of advancement in every part of the state. Grapefruit trees, especially, were in the full flush of growth. Orange trees were also growing, and many were in full bloom. Tangerine trees had not reached the advanced state of growth of either the grapefruit or orange trees, but some growth was taking place. Young trees, especially, were growing vigorously. It is due to this condition of growth that the trees were injured so severely. Tangerine trees, being quite dormant, were not damaged very seriously and if other citrus trees had been equally dormant, little damage would have resulted from the cold.

The cold wave not only seriously damaged the citrus and other semi-tropical trees and shrubs, but also it was of the greatest importance in reducing the numbers of injurious pests which infested the trees. Some of these were frozen outright, while others were affected when the plant was defoliated or killed.

THE CITRUS WHITE FLY (*Dialeurodes citri* R. & H.)

It has been known for many years that low temperatures do not kill the citrus white fly. It survives on privet in the temperatures of North Carolina, and the recent cold wave did not injure this species on privet in any section of the State. It is very doubtful if the recent freeze in Florida has directly killed any pupae of the citrus white fly. The defoliation of citrus trees, however, has resulted in reducing the number in many places and localities to the point of almost complete extermination. This is especially true in all the counties of group one. In Putnam and Volusia Counties the only specimens of white fly pupae were found on privet, or in groves that had been fired. In Marion, and parts of Lake and Orange Counties, a few survived, but not sufficient to be of importance for at least a year. This cold has given the white fly such a severe setback in these counties that it will be many years before it will become as abundant as formerly. Examinations made October 3rd still showed this pest to be very scarce in this temperature zone. No spraying has been necessary to control this pest this season. There were a few groves that were fired from which, and the privet, the white fly will re-infest all the groves in the community.

Since there were scattering leaves left on thousands of trees, there were many more of the citrus white fly in the counties of groups 2 than group 1. Probably not more than 1 pupa in 1000 emerged. On October 3rd the white fly was about as abundant as if no freeze had occurred, and much sooty mold appeared on the trees. Many groves should have been sprayed during October and November to control this pest.

In the warmest zone examinations were made only in Pinellas County. Although there was considerable defoliation, it was not of any great importance in reducing the numbers of the white fly. On May 10th there were many groves that needed to be sprayed for this insect. On October 3rd the white fly had blackened many groves. More perhaps were present than at any time since its first appearance in this section.

THE CLOUDY-WINGED WHITE FLY (*Dialeurodes citrifolii* MORGAN).

This species infests only citrus and is found largely on grapefruit. Since the grapefruit suffered such a complete defoliation in the counties of both groups 1 and 2, and a much greater defoliation in group two than oranges, this species of white fly has

not been much in evidence since the freeze. It is more than likely that it will be sometime before it again becomes a seriously injurious pest in the counties of groups 1 and 2. In group 3 it was abundant October 3, 1917.

The injured leaves fell from 10 to 14 days after the frost and dried up in the course of a day or two afterwards. Owing to the length of time the freeze occurred before the regular period of emergence of the white flies, none were observed to emerge from the leaves that had fallen. The freeze evidently shows that the white flies are much more resistant to cold that the citrus trees, and were destroyed only in proportion to the extent of the defoliation.

THE PURPLE SCALE (*Lepidosaphes beckii* NEWMAN).

In the counties of group one this pest was almost exterminated. Since practically all the leaves were lost and a majority of the trees had nearly all the branches killed back from three to six feet, there was little chance for the survival of this species. In addition, many were actually frozen. So far as could be observed, the eggs were not frozen sufficiently to prevent them from hatching, so those which were located on the larger branches will hatch and re-infest the trees. A few living females were observed at Crescent City on some old fruit, still on the trees. No living scales other than these were observed in several days' search, from May 3rd to 6th, and again on May 24th. There was considerable scale on some fruits in October. Reports indicate that this scale insect has become fairly abundant in November, 1917.

In the counties of group two, this insect also received a most severe setback, but not to the extent that it did in group one. All insects on the fallen leaves, as well as those on the dead branches, were killed and all young scales frozen. On February 20th an examination of ten fallen leaves, but still green, was made. 150 young scales were dead and one female living. On two dried leaves 2 dead adult females, 1 living adult female and 11 dead young scales were found. If this leaf had been left a day or two longer, the living female would also have been dead. No young scale have been observed up to June on the new growth at any place in this group of counties. The trees, as a whole, are remarkably free from scale, due no doubt, to the effects of the freeze. At the present time (October) this species is quite abundant and not far from normal infestation.

In the warmest of the three groups the defoliation and the mortality, as the result of the freeze, has been the cause of greatly reducing the number of scales, but not to the extent as to make spraying this spring unnecessary. In Pinellas County there were many young scales and crawlers observed on May 10th. On October 3rd, 1917, this pest was most abundant. No indications were present that any had been killed by the frost.

RED SCALE ON CAMPHOR (*Chrysomphalus aonidum* L.).

It was impossible to make observations of this scale on citrus, so the examinations were made where it infested camphor. Since the camphor did not lose its leaves from frost injury, the examination showed how effective the cold had been in freezing the scales instead of killing them by damaging the foliage. On February 7th, or 4 days after the frost, extensive examinations showed that nearly all stages except the eggs had been hurt by the frost. The adult females did not have a normal appearance.

On February 16th examinations of 250 adult females, 11 immature stages and 6 males were dead and 5 adult females and 9 immature stages were living. It was noticeable that more than 25% of the adult females had dead crawlers beneath the scale covering. It was also noticeable that they had died very recently, since they were not dried up at all, but had just turned brown during the previous week. From another tree there were 100 adult females, 60 immature and 14 males killed by the frost, and 5 adult females and 9 immature stages living. Dead crawlers beneath the scale coverings were also present. The two examinations give 94% dead and 6% living. No doubt the percentage of dead was greater since many of the young stages including the crawlers were not counted.

On June 1st there was considerable red scale on the camphor trees from which the leaves were taken for the above examinations. Both on October 3rd and December 2nd as many were present as if no reduction in numbers had taken place.

The frost also killed this scale on privet. On February 17th I found 25 adult females dead and none living. Three of these had eggs with a normal appearance, and one of these three had crawlers. There were not more than 15 eggs with normal appearance and many females had dead crawlers near the opening. On June 1st not a single specimen of red scale could be found on the privets that were examined last spring. On December 12 there are no red scale on these same privets.

When one takes into consideration the mortality suffered by

this species on camphor and compares it with the possible mortality it suffered on citrus, from both defoliation and low temperatures, it is very doubtful if more than one insect in ten thousand survived. In fact, it would be nearer the truth to say that not more than one in a hundred thousand survived the cold.

It has been impossible to make observations on this species in group three.

THE RUST MITE (*Eriophyes oleivorus* ASHM.)

At the time of the cold wave there was an abundance of mites present; many more than is ordinarily the case at that season of the year. These were partially frozen and partially killed because the foliage was shed.

Examinations were made at Orlando during the cold wave, on February 3, or after the first cold night, and before the second one. No mites could be found on a small sour tree, located in an exposed situation, on which many thousands had been present all season previous to the frost. On February 7th examinations of green leaves, still on the trees, showed the mites were very scarce compared with the number present before the frost.

The rust mite cannot live on dead fallen leaves. On February 10th green leaves picked up from the ground were examined and no living mites were found. On the same day 17 living mites and three eggs were found on 10 leaves from a tree in a protected location. On 24 green leaves from the trees, 4 living mites were found and from 17 green leaves picked from the ground, 1 living mite was present. No mites were ever found on dry leaves. There is no doubt that the rust mites present on the trees and fruit now are the progeny of those that survived on the leaves uninjured by the frost.

In the counties of group one the mites were nearly exterminated. Those that were not actually frozen perished with the drying of the leaves. In examining six groves, May 3 to 6, in two days only two mites were observed. In a normal infestation there would have been literally billions present. In Marion County, on May 24th, they were also extremely scarce.

In the counties of group two they received a severe setback. A conservative estimate of the mortality would be more than 99%. In fact, on June 1, or more than four months after the frost, they have only become as abundant as they were before the cold wave. Since the freeze the weather has been extremely favorable for the reproduction of the mites, and this pest is so abundant

(Continued on page 38)

The

FLORIDA BUGGIST

Official Organ of The Florida Entomological Society, Gainesville, Florida.

PROF. J. R. WATSON.....Editor
DR. E. W. BERGER.....Associate Editor
K. E. BRAGDON.....Business Manager

Issued once every three months. Free to all members of the Florida Entomological Society.

Subscription price to those who are not members of the Society—60c per year in advance; 15c per copy.

It is the earnest desire of the editors that our members, and especially those outside of Gainesville, should send in brief paragraphs for the Buggist. Nearly every member must run across things that would be of general interest. We desire also any personal items concerning our members or other entomologists who may be in Florida. These notes should reach us by the tenth of the month of publication, March tenth for the next issue.

Please note the 25% increase in size of the Buggist this instar. With the new volume we expect to molt and come out with entirely new headgear.

Aphids, especially Myzus persicae, the Garden Aphid, seem to be more numerous than usual at this time of the year. This is probably due to the unusual amount of damp cold weather during the past month which has checked their parasites and predators.

The colony of Delphastes catalinae, the whitefly-eating ladybeetle introduced from California into a grove near Bradentown by the Station Entomologist, is reported to be spreading at a highly satisfactory and encouraging rate.

A BRANCH OF THE SOCIETY IN FT. MYERS

Altho less than two years old our society is about to have a branch and it is larger than was the parent society at the time of birth. Twelve men in Ft. Myers have formed "The Lee County Entomological Society" and have applied for membership as a branch society. The members are S. B. Walker, Pres.; Fritz Fuchs, Vice-Pres.; Roy Thompson, Secretary and Treasurer; C. A. Bass, R. G. Bateman, W. L. Benedict, F. S. Ballentine, R. G. Oliphant, P. F. Robertson, J. L. Sheldon, A. S. White, all of

Ft. Myers, and A. H. Andrews of Estero. Five of the men have been members of our society for some time and the president is a charter member. Most of the men are connected with the State Plant Board.

The society meets once each week and in addition to other work they are studying Sanderson and Jackson's text book on entomology.

It was the Editor's good fortune to meet with them the last week in October. A more wide-awake and earnest group of men would be hard to find. Men who will spend the whole of a summer day in Florida in a grove looking for citrus canker and then spend the evening studying entomology will be heard from.

May the branch grow as has the parent.

AS OTHERS SEE US

Under the heading "The Florida Entomological Society and Its New Organ," the Entomological News of Philadelphia in its November issue gives a brief notice of our society and The Buggist, concluding with, "No richer field for the cultivation of entomology than the Southeastern States exist, and such a society as that of Florida ought to flourish as the whitefly, the sweet potato root weevil and the Anopheles mosquito which their members discuss in their new journal. May they succeed in eradicating these insect pests and their society and Buggist widen our knowledge for many years to come."

PERSONALS

Our first Secretary-Treasurer, R. N. Wilson, now Agricultural Demonstration Agent for Palm Beach County, who met with a serious automobile accident, is now out again.

Prof. W. S. Blatchley, former State Geologist of Indiana and author of several papers on Florida insects, who addressed us last winter, passed thru Gainesville on November 30 bound for his winter home in Dunedin.

Mr. C. H. Popenoe of the U. S. Bur. Ent., Washington, is now in Florida in connection with extension work on the sweet-potato root weevil in cooperation with the Experiment Station and the State Plant Board.

Dr. E. A. Back, also of the Bureau, was in Gainesville the first of the month making arrangements for an extension entomologist to take up storage insects and especially the corn weevil in cooperation with the University.

Mr. W. W. Yothers of the Orlando Laboratory, U. S. Bur. Ent., was married on December 6 to Miss Ada Bumby of Orlando.

Prof. J. R. Watson while passing through the fair city of Arcadia a few weeks ago had to wait on the E. & W. C. train; not being acquainted in the city, and in order to while away the time, he secured his insect net and decided to collect a few membracids and other insects around town.

Some of the older settlers not being familiar with the work of an entomologist at once reported his actions to the mayor. Mayor Royal while on his way to the scene of action met Sheriff Dishong, and the two officials after viewing the strange actions of the "German Looking Fellow" from a distance decided that something was radically wrong, so he was at once taken into custody. Upon searching his baggage a number of bulletins were found and his identity established. Professor was very angry, but his pardon was begged and he went on his way to Bradentown.—*Correspondent.*

Note:—Lucky for the Professor that he did not have a stray copy of *The Jeffersonian* in his baggage, or that the zealous but uninformed officers did not find his insect-poison bottle.

THE EFFECTS OF THE FREEZE OF FEBRUARY 2-4, 1917 ON THE INSECT PESTS AND MITES ON CITRUS.

(Continued from page 35)

now in nearly every part of this group of counties that spraying should be done if bright fruit is to be obtained. The only result in the reduction of the mites by the freeze has been the postponement of the time of maximum infestation in these counties about a month or six weeks.

In the localities of group three they were also greatly reduced in number but not sufficiently to be of any great economic importance. Spraying had to be resorted to at about the same time as in an ordinary season.

By late July and early August the rust mite had become very abundant. In fact, it is generally believed now, that there were more present than ever before in the history of the citrus industry. On October 3rd, however, the species is very scarce. Several groves were examined the first of October and only a few hundred were found. The almost complete extermination of this species by the freeze and its reproduction to billions in six months is a most remarkable biological fact. According to computation,

one mite would have a progeny of about 12 million in about 5½ months, and I believe this is just about what actually took place. We saw many grapefruit with an estimated number of half a million, and this condition was the same over the entire state. The "sands of the sea" or "the stars of heaven" are the only expressions that will enable one to understand how abundant this species actually was the last of July and early August.

RED SPIDERS (*Tetranychus sexmaculatus* McGR.)

No opportunity has been offered to determine the effects of the freeze on this pest. Few were present at the time and few have appeared this season. In fact, they have not been so abundant this season as normal.

THE PURPLE MITE (*Tetranychus citri* McGR.)

So far as could be ascertained, the adults did not appear to have been hurt. The eggs, however, had a very soft and unnatural appearance. Since the freeze this pest has not been very abundant and this is, no doubt, due to the eggs being injured by the cold.

ORANGE APHIDS

The aphids infesting an orange tree before the freeze were dead on February 7th. No eggs were present in the colony. This was the same condition as was observed by Hubbard in 1895.* Since the freeze, however, there have been more aphids on the young sprouts than during any other spring in my recollection. These were soon killed by parasites and predaceous enemies and were of little economic importance.

EFFECT OF THE FREEZE ON THE PESTS OF OTHER PLANTS THAN CITRUS.

Tenuipalpus bioculatus McGR.

This species on privet was slightly, if any, damaged by the cold. Living specimens were found February 17th. These, however, may have been hatched since the cold.

Tetranychus yothersii McGR.

This species on camphor seems to have been very seriously hurt. On February 7th the adults were nearly all dead. Only a few showed any signs of life, such as moving their legs, and only one on the entire lot of leaves was active. The eggs also did not appear to be normal, being soft and easily broken. On February 17th put some camphor leaves, having an abundance of eggs, into

*Hubbard in "Insect Life," Vol. VII, pp. 281, 282.

a tumbler. On March 7th there was only one living mite and the eggs were still red in color, but they were not normal nor had they hatched. They were soft, and when broken contained a liquid instead of a young spider. Another collection of leaves made just after the freeze and examined on February 15th, gave the same results; the eggs did not hatch. On another tree there were many unhatched eggs. On February 17th these appeared to be very soft. On these same leaves there were 13 young mites that had evidently hatched since the freeze. No doubt the adults, young mites and eggs were largely killed when in exposed places.

In fairly well protected spots the adults and young were not killed. On February 29th there were 23 adult females, 8 males and 10 young mites living on a few camphor leaves. The eggs, however, did not appear to be normal. They had that same dull look as the others that never hatched.

The observations on this mite show that all stages are easily affected by the cold, and especially are the eggs damaged, which is contrary to expectations. The adults survive only in protected places. On June 1 there were practically none of this species present, while there are specimens of *Tetranychus sexmaculatus* and *Tetranychus citri.*

NOTES ON SOME INSECTS OF SOUTH FLORIDA IN 1917

By R. N. WILSON

(Paper given before the Florida Entomological Society.)

The above title is somewhat too inclusive, as the observations were made almost entirely in Palm Beach County, tho some were made in other counties.

Dictyophorus reticulatus—The Lubber Grasshopper. These large grasshoppers were very numerous on some of the drained saw-grass lands along the Palm Beach Canal in the Everglades, but because this land has not yet come under cultivation little damage resulted. Along the shores of Lake Okeechobee where severe injury has resulted from their attack during certain years, these grasshoppers were present in small numbers, but were not troublesome. The writer's previous experience with this species at Fellsmere and other points had proved that it could be controlled with the so-called "Kansas Mixture" (bran, paris green, syrup and citrus fruit) even when there was a large influx from surrounding lands. None of the melanic forms were found, as would be expected from the known distribution of the various forms.

Empoasci mali—The "Green Fly." This little jassid or leaf hopper, which is commonly called the "Green Fly," made its appearance very late in the spring, and caused injury only in small areas during the entire summer. This is quite an unusual occurrence since snap beans maturing in March are often severely attacked, and cowpeas may be entirely destroyed during the average summer. The reasons for the scarcity of this jassid during the year are not known, tho many farmers attribute it to the cold in early February. No satisfactory control measures are known, even on truck crops. The promising contraption for catching the leaf hoppers invented by Mr. Oller of Delray is not now in use, because, altho thousands of the insects were caught the numbers remaining in the fields were not perceptibly reduced. On account of its wide range of food plants swarms of this jassid may come in from adjoining lands.

Laphygma frugiperda—The Fall Army Worm. The habits of this insect seem to be slightly different in South Florida than in other parts of the United States, in that altho they are extremely numerous during spring, summer and fall, particularly in corn fields, they rarely assume the "army" habit. There are few of our insects that do more damage than the Fall Army Worm, and the limited acreage of corn on the lower East Coast is not increased because this insect is present. Corn planted in February or early March can mature and escape with only slight injury, but later plantings of corn, other than the Nassau corn and its close relatives which have some immunity, are usually riddled and sometimes even its ensilage value destroyed. Altho some farmers have tried to control the pest with arsenate of lead, few of them have been persistent, and little good has resulted. This species is more often found in the ears and damages them more in South Florida than the common corn ear worm, *Heliothis obsoleta.*

Diabrotica vittata—The Cucumber Beetle. Just how long this species has been in South Florida is uncertain, estimates varying from two to five years, but certainly in that time it has come to be one of our most important insects. These beetles were in the fields in considerable numbers during the freeze in early February, which apparently did not injure them. Altho their principal injury is to cucurbits, sunflowers and other plants are sometimes injured, and during the spring the writer saw them attack the tender foliage of citrus trees in a few localities. They occur on the cucurbits in such swarms that the usual poisons

and repellants do not seem effective, but excellent results were obtained this year by frequently covering the plants with cornmeal or flour, and sometimes arsenate of lead was mixed with these. The beetles apparently prefer to eat the meal or flour to eating the plants, and with careful and frequent dusting the plants can be saved.

Chalcodermus aeneus—The Cowpea Pod-Weevil, or Cowpea Curculio. It was with considerable surprise that the writer found heavy infestations of this beetle on the east shore of Lake Okeechobee, because this section has had almost no previous cultivation, and has been absolutely isolated from cultivated areas. This observation probably points to a native food plant on which the beetle has been thriving in that locality. No control measures were attempted in the Lake region and the peas in several fields were a total loss. Along the coast in Palm Beach County little damage by this species was seen or reported.

Phytoptus calacladophora—White Mold. Many farmers believe the moldy appearance caused by the infestation of this mite to be a disease, which is not surprising when we consider that the mite is usually difficult to see with the naked eye. During the year this species became very abundant on tomatoes, and the most interesting point observed was that on muck lands the farmers had little trouble bringing it under control with the sulphur sprays, while on the sandy lands it seemingly could not be stopped by almost continual spraying and caused very severe injury. Farmers report that this is the case to a certain extent every year.

Millipedes. On the shore of Lake Okeechobee where eggplants and peppers were set in the muck lands following the clearing of heavy weeds and brush in August and September they were attacked by millipedes and some injury done. The millipedes did most of their work at night, tho some few could be found on the plants in day time. Upon digging around the plants three to six millipedes could be found in many instances. The damage was most pronounced near the edge of the fields, and investigation showed that there were thousands of the millipedes under the piles of brush. Arsenate of lead was recommended as a control measure, and probably the "Kansas Mixture" broadcasted would be effective.

Negro Bugs. During August and September there was considerable complaint of injury in the Lake Okeechobee region from these small black bugs, which the farmers called beetles. It

is certain that large numbers of the bugs were present in the seed beds and in some fields, but the writer is inclined to doubt that they did much damage. Prof. Watson recommended crude carbolic acid used at the rate of a tablespoonful to two gallons of water or a dust made by adding a half pint of the acid to a bushel of lime or plaster, but I do not know what results were obtained.

Tabanids. Among our very worst pests of livestock are the large Tabanids which appear in great numbers for from four to eight weeks in the spring. I have seen even mules covered with bloody splotches caused by the bites of these insects in one day. Work animals are usually protected by repellant mixtures, mechanical means or by screening their quarters, but the unfortunate range animals suffer severely and lose weight considerably during this period. This is a problem to which little attention has been given, and which, in justice to our growing livestock industry, deserves to be attacked with vigor.

BOOK AND BULLETIN NOTICES

The October number of the Quarterly Bulletin of the State Plant Board contains two valuable articles on scale insects. The first on "Some Florida Scale Insects," by C. E. Wilson, lists 83 species, most of which are illustrated by original photographs. This is a very credible list and should be a great help to those working with these insects.

We note under Cottony Cushion Scale, p. 18, many plants listed as not having been found infested in Florida that should have been recorded among the Florida hosts, as they were found infested at Key West (See An. Rep. Fla. Ag. Exp. Sta. 1915 p. lxxiv).

The second article by Dr. E. W. Berger on the control of scale insects is the latest word on the subject.

Press Bul. 285, Fla. Ag. Exp. Sta., is on the San Jose Scale and No. 286 treats of the Boll Weevil in Sea Island cotton.

Farmers' Bul. 875, U. S. D. A., treats of (*Ligyrus*) *Euetheola rugiceps* which the authors, Philip and Fox, call the rough-headed corn stalk-beetle. This beetle is common in Florida but no serious injury to corn seems to have been noted.

Farmers' Bul. 843 on pecan insects is of peculiar interest to us, as it is the result of work done mostly in Florida by J. B. Gill, who is stationed at Monticello.

Bul. 609, U. S. D. A. (Professional Paper), is on *Pilocrocis*

tripunctata, which the author (T. H. Jones) calls the sweet-potato leaf-folder. This pyralid moth was in October bred out from sweet-potatoes on the Station grounds, where it was working with Prodenia. The point that attracted our attention was that it was not controlled by the Kansas bait as was Prodenia, doubtless because it feeds largely in the rolled up leaves. The damage it did was inconsequential.

"Fleas and Their Control," is the subject of Farmers' Bul. 897, by F. C. Bishopp.

"The Life of the Caterpillar" (Dodd Meade and Co.) has been translated from the works of that delightful French author Fabre, "The Insects' Homer."

REPORTS OF MEETINGS

(K. E. BRAGDON, Secretary)

Science Hall, Gainesville, Fla., Oct. 10, 1917

The meeting was called to order by the President with about seventy members and visitors present.

The report of the Secretary was read and approved.

The executive committee reported on the following names and they were elected as members in the Society:

W. N. Hull, Dept. Port & Ry. Insp., State Plant Board,.....Miami, Fla.
James Kerr, Inspector, State Plant Board.....Santa Rosa, Fla.
Dr. Hiram Byrd, Scient. Sec'y State Board of Health.....Jacksonville, Fla.
Harold Mowry, Inspector, State Plant Board.....Santa Rosa, Fla.
Clarence A. Bass, Inspector, State Plant Board.....Ft. Myers, Fla.
R. G. Bateman, Inspector, State Plant Board.....Groveland, Fla.
C. D. Kime, Co. Dem. Agt., Brevard Co.....Titusville, Fla.
Wm. Gomme, Co. Dem. Agt., Lake Co.....Tavares, Fla.
O. W. Caswell, Co. Dem. Agt., Manatee Co.....Bradentown, Fla.
R. F. Walker .....Haines City, Fla.
A. M. Klemm, Nurseryman.....Winter Haven, Fla.
Max E. Viertel, Citrus grower .....Winter Haven, Fla.
John Adams Comstock.....321 S. Hill St., Los Angeles, Cal.
A. W. Street, Citrus grower .....Ormond Beach, Fla.
W. N. Crooks, Citrus grower.....Viking, Fla.
J. W. Carson, Citrus grower .....Frostproof, Fla.
M. B. Allen, Allencroft Nurseries.....Mt. Dora, Fla.
Thomas J. Baker, Asst. Nurs. Insp., St. Plant Board.....Gainesville, Fla.
James F. Marsh, Inspector, State Plant Board .....Groveland, Fla.
S. F. Pool, Citrus grower .....Winter Haven, Fla.
M. Marcellus Javens, Citrus grower .....Mt. Dora, Fla.
F. F. Bibby, Assistant Entomologist, St. Pl. Bd. .....Gainesville, Fla.
F. J. McKinley, Co. Dem. Agt. .....Miami, Fla.
Alfred Warren, Co. Dem. Agt.....Ft. Pierce, Fla.
Mrs. Marie Conway Oemler .....Savannah, Ga.
L. R. Warner, Asst. Nurs. Insp., State Plant Bd. .....Gainesville, Fla.
C. H. Thompson, Citrus grower .....Winter Haven, Fla.
J. P. Donnelly, Citrus grower .....Mt. Dora, Fla.
A. A. Lewis, County Dem. Agent .....Kathleen, Fla.
E. E. Truskett, Citrus grower .....Mont Verde, Fla.
Alex Finlay, Citrus grower .....Orange Center, Fla.

B. F. Floyd, Agri. Expt. Sta. ..... Gainesville, Fla.
C. D. Gunn, County Dem. Agent ..... Starke, Fla.
E. G. Gustafson, Citrus grower ..... Ft. Pierce, Fla.
T. J. Iles, Citrus grower ..... Crescent City, Fla.
E. J. Kaufmann, Citrus grower ..... Lakeland, Fla.
Thomas R. Robinson, Inspector, State Plant Board ..... Bradentown, Fla.
Robert Ranson, Citrus grower ..... St. Augustine, Fla.
A. S. Hooker, Inspector, State Plant Board ..... Groveland, Fla.

Mr. W. W. Yothers read a paper on "Effects of the Freeze on Citrus Insects."

Mr. R. N. Wilson gave a talk on "Some Insects of South Florida." General discussion of the points brought out by these two gentlemen followed.

Under "Brief and Timely Notes" Dr. W. A. Wyman mentioned the double strength bordeaux mixture and made a plea that further experiments with this solution be carried out. Dr. E. W. Berger exhibited a specimen of an insect of the genus *Gymnaspis* on *Bilbergia*.

Prof. Watson spoke of the successful use of the "Kansas Mixture" in controlling the Sweet-potato Caterpillar. Mr. J. A. Miller spoke of the milliped attacking the Irish potato. Mr. O. D. Link spoke of a worm affecting the navel orange in Louisiana and of brown beetles boring into oranges where leaves came into contact with them.

Science Hall, Nov. 19, 1917.

The regular monthly meeting of the Florida Entomological Society was called to order at 4:30 p. m. by the President, with the following members present: Wilmon Newell, E. W. Berger, F. M. O'Byrne, J. R. Watson, S. P. Harn, O. T. Stone, F. F. Bibby, J. H. Montgomery, Frank Stirling, L. Russell Warner, H. S. Davis, T. Van Hyning and K. E. Bragdon.

The minutes of the last meeting were read and approved. It was suggested that the students of the University of Florida be invited to attend our meetings and that notice of each monthly meeting and the program be published in the Gainesville Sun.

The matter of a suitable heading for the "Florida Buggist" was discussed and it was voted that this be left to the discretion of the editors.

After a discussion of the matter of our affiliation with the Florida Academy of Sciences, it was voted that the Secretary write to all non-resident active members of the Society and ascertain their views, in order that a vote may be taken at the next meeting to decide whether our society should withdraw as a section of the Florida State Academy of Sciences.

The following new members were elected by acclamation as associate members:

K. S. Lamb, Inspector, State Plant Board.....Gainesville, Fla.
O. D. Link .....Buras, La.
Wm. L. Drew, Citrus grower .....Eagle Lake, Fla.
J. G. Atherton .....Lakeland, Fla.
Dr. W. E. A. Wyman, Citrus grower .....St. Petersburg, Fla.
Vet L. Brown, Nurseryman .....Winter Haven, Fla.
W. Bartlett, Nurseryman .....Ft. Ogden, Fla.
H. H. Hume, Nurseryman & Pres. Fla. Hort. Soc. .....Glen St. Mary, Fla.
H. A. Wartmann, Inspector, State Plant Board .....Citra, Fla.
B. F. Flowers, Inspector, State Plant Board .....Sebring, Fla.
John Schlobig, Inspector, State Plant Board .....Sebring, Fla.
M. M. Bass, Inspector, State Plant Board .....Groveland, Fla.
W. O. Lahrman, Inspector State Plant Board .....DeLand, Fla.
O. T. Stone, Clerk, State Plant Board .....Gainesville, Fla.
A. L. White, Citrus grower .....Ft. Myers, Fla.
C. G. Bishop, Citrus grower .....Monticello, Fla.
J. M. Mears, Inspector, State Plant Board .....Manatee, Fla.
L. O. Smith, Inspector, State Plant Board .....Wauchula, Fla.
H. C. Artis, Inspector, State Plant Board .....Wauchula, Fla.
S. E. Cassino, Publisher .....Salem, Mass.
C. E. Whittington, Asst. Nurs. Inspector, State Plant Board.

The Business Manager of "The Florida Buggist" reported that the total receipts for subscriptions, advertisements, etc., to date, amounted to $74.45; that the total expenditure in publishing numbers 1 and 2 and mailing same to members and others amounted to $73.86, leaving a balance of $0.59.

The paper of the evening, entitled "The Spiny Citrus Whitefly in Cuba," was given by Mr. Newell, and was followed by an extended discussion. This paper will be printed elsewhere.

Mr. F. F. Bibby gave a short talk on the distribution of the boll weevil in Florida.

Dr. Berger's article, "Entomology as a Pure Science," was postponed for the next meeting on account of the lateness of the hour.

Under "Brief Timely Notes," Professor Watson reported the following insects:

"Negro Bug," as infesting chufas in various parts of the state.

Epicaerus formidolosus, as infesting beans and being found on cotton and cowpeas, being apparently more abundant this year than usual.

Vaginulus floridanus, a slug on tomatoes, found at Dania, Fla.

The Woolly Whitefly, in St. Lucie County.

K. E. Bragdon reported that the seaside morning-glory was apparently a preferred host plant of the Sweet-potato Root-weevil, since it could be found in this vine when it could not be found in adjacent sweet potato plants.